

REMARKS

In the June 17, 2004 Office Action, the Examiner noted that claims 1-10 were pending in the application; objected to the drawings and the specification; and rejected claims 1-10 under 35 U.S.C. § 103(a). In rejecting the claims, U.S. Patents 6,080,988 to Ishizuya et al. and 6,343,866 to Cao et al. (References A and B, respectively) were cited. Claim 4 has been canceled and thus, claims 1-3 and 5-10 remain in the case. The Examiner's rejections are traversed below.

The Application:

The present invention is directed to an optical device, such as the one illustrated in Figs. 4A and 4B which includes VIPA optical element 24. As described in the application, "to compensate for wavelength dispersion, an operating wavelength can be accurately adjusted by heating the VIPA optical element and controlling its temperature" (page 10, lines 5-7). However, as described in the following paragraph, if there are variations in the temperature of the VIPA optical element degradation of the optical characteristic can occur, such as the increase of insertion loss and decrease of transmission band. To avoid such degradation, fixing material 25 (Fig. 4B) is attached to all of the rear surface of the VIPA optical element and to cabinet 23 which is heated by heater 21. As a result, the VIPA optical element is heated by conduction from the cabinet via the fixing material (see page 14, lines 12-22) and to a lesser extent, by convection via the air in the cabinet and by radiant heat from the cabinet.

The Prior Art:**U.S. Patent 6,080,988 to Ishizuya et al.**

The Ishizuya et al. patent is directed to optically readable radiation displacement-conversion devices. In the second embodiment illustrated in Fig. 5, "imaging lens 20 converges a flux i of infrared light to form an infrared image on a plane 4P defined by the first films 4 ... of all the pixels of the conversion device 100" (col. 23, lines 32-35). As described for the first embodiment illustrated in Fig. 1(a), "the first film 4 serves as an infrared-absorber for receiving incident infrared rays i and converting the rays to heat. The second film 5 serves as a readout-light reflector" (col. 18, lines 6-9). The "first and second films 4, 5 collectively form a 'displaceable member' [3] that exhibits a deflection relative to the substrate 1 by an amount corresponding to the amount of heat generated in the first film 4 by absorption of infrared light" (col. 18, lines 18-16). "The direction in which the readout light j is reflected [by the second film 5] depends on the amount of deflection of the suspended portion 3" (col. 18, lines 33-35).

In the ninth embodiment illustrated in Figs. 12(a)-12(b), the conversion device of Figs. 1(a)-1(d) "is enclosed in a vessel or container 110 ... in which the atmosphere is evacuated ... [to improve] the thermal insulation of the conversion device" col. 32, lines 36-38). The container 110 includes windows "112 transmissive to infrared light i and opaque to other light" (col. 32, lines 57-58) and "113 transmissive to the readout light j and opaque to other light" (col. 32, lines 61-62). Also included is "a thermoelectric temperature stabilizer (TTS) 111 ... for generating or absorbing heat as required" (col. 32, lines 47-49).

The fifteenth embodiment illustrated in Fig. 23 and described at column 46, line 47 to column 48, line 62 provides additional details of how and why temperature is stabilized. The vacuum in container 110/142 and TTS 111/145 is provided "to prevent ... temperature changes in the surrounding environment, from being convectively transferred to the conversion device 140. This provides even more stability to the substrate temperature and thus to the image produced by the apparatus" (col. 48, lines 27-32). In all of the embodiments that mention temperature, the components are designed so that, "the temperature of the substrate of the conversion device 140 is maintained constant" (col. 48, lines 49-51).

U.S. Patent 6,343,866 to Cao et al.

The Cao et al. patent is directed to an optical apparatus which uses a virtually imaged phased array (VIPA) to produce chromatic dispersion. Roughly a column and a half of the Summary of the Invention and a paragraph in column 11 were cited describing the VIPA which Applicants acknowledge is a known component.

Objections to the Drawings & Specification

In the first paragraph on page 2 of the Office Action, the Examiner objected to the drawings due to the failure to show Figs. 5A and 5B as described in the specification. In the next paragraph, the Examiner objected to the specification due to the failure to include a reference to Figs. 11A and 11B in the Brief Description of the Drawings. Fig. 5 has been amended to show the views as separate drawings, Figs. 5A and 5B, and to amend the specification, as required. In addition, spelling errors in Figs. 5, 9 and 10 and in the paragraph spanning pages 20 and 21 have been corrected. Approval of the changes and withdrawal of the objections are respectfully requested.

Rejections under 35 U.S.C. § 103(a)

On pages 3-5 of the Office Action, claims 1-5 and 7-10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ishizuya et al. Claim 1 has been amended to recite that the fixing means is "attached to substantially all of the rear surface of said optical element and fixed to said cabinet" (claim 1, lines 5) and that the "optical element has a temperature controlled uniformly by said heater through said fixing means and the air inside said cabinet" (claim 1, last 3 lines) as described on, e.g., page 14 of the application. On the other hand, Ishizuya et al. teaches a thermoelectric temperature stabilizer (TTS 111, Fig. 12(a)) that is only in contact with a small portion of conversion device 100, because readout light j passes through a hole in container 110 and a corresponding hole in TTS 111 (see column 32, line 60 to column 33, line 2). Furthermore, there can be no heating by "air inside said cabinet" as recited in claim 1, since in the device taught by Ishizuya et al. the air is evacuated from the chamber to insulate the suspended portion of the conversion device. For the above reasons, it is submitted that claims 1-3, 5 and 7-10 patentably distinguish over Ishizuya et al.

On pages 5-6 of the Office Action, claim 6 was rejected under 35 U.S.C. § 103(a) as unpatentable over Ishizuya et al. in view of Cao et al. Nothing has been cited or found in Cao et al. overcoming the deficiency of Ishizuya et al. discussed above. Since claim 6 depends from claim 1, it is submitted that claim 6 patentably distinguishes over the combination of Ishizuya et al. and Cao et al. for the reasons discussed above.

Summary

It is submitted that the prior art does not teach or suggest the features of the present claimed invention. Therefore, it is submitted that the application is in condition for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

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If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS:

The attached drawings include changes to FIGS. 5, 9 and 10. The sheets containing FIGS. 5A and 5B replaces the original sheet containing FIG. 5.

In the Office Action on page 2, the Examiner objected to the drawings. To overcome these objections, replacement sheets for Figs. 5A and 5B are submitted herewith for Fig. 5.

In addition, spelling errors on Figs. 5, 9 and 10 have been corrected by the replacement figures, as indicated in red on the annotated sheets showing the changes made for the convenience of the Examiner.

Approval of these changes to the drawings is respectfully requested.